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The Progressive Farmer.

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FERTILIZERS: OFFICES OF NITROGEN, PHOSPHORIC ACID AND POTASH IN PLANT GROWTH.

While all three of the fertilizer constituents—nitrogen, phosphoric acid and potash—are necessary to the full development of plants, their most important offices or functions are directed more particularly toward the development of special parts of plants.

Nitrogen has for its most important office the production of stalks, stems and leaves, rather than fruit or seed, the effect of too great an amount of nitrogen in fertilizers being to cause plants to produce weed at the expense of seed. Plants of rich green color and good size are not in need of nitrogen, while small, pale, sickly ones are in want of it. Soils that grow large plants have more nitrogen proportionately than the other two constituents and need phosphoric acid or potash, or both, to aid in the fruit or seed producing function.

Where large applications of barnyard manure have been made, there is always a heavy weedy growth; frequently in the case of cotton the stalks are very large and the bolls few, and the maturity of the entire plant is greatly delayed by the prolongation of the growth of stalk. Examples of this kind are seen in the small fields surrounding barn lots where it is convenient to distribute the manure and not infrequently the washings from the barn lots carry the best part of the manure in this way to the adjoining area around the barn. This large excessive growth is also true of corn after heavy applications of manure, though corn will stand more of this kind of fertilization without detriment to the yield of ear than will cotton. In like manner where there has been a heavy growth of peas, clover, or other soil-improving crops of this class, there is also a large, stalky growth. The main fertilizer constituent in barnyard manure, peas, and clover is nitrogen, and in the growth of crops after peas, clover and manure, the nitrogen in them manifests itself very strongly in this one-sided, but very important phase of growth, if the quantity be large. Black rich soils contain a very large amount of vegetable matter which carries nitrogen as its main constituent, and as a consequence, on these lands there is a larger development of stalk and leaf than fruit. A good example of these is found in the pocosin soils in the eastern part of the State, some of which contain as much as one-half of 1 per cent of nitrogen, and do not need any of this constituent in the fertilizer applied to them to produce good crops.

In all the cases referred to above, where there is a large development of stalk and leaf at the expense of fruit, no nitrogen is needed in the fertilizer, but applications of phosphoric acid and potash in some of the materials supplying these are extremely beneficial, if not absolutely necessary, to make the plants produce seed or fruit in proportion to stalk and leaf.

The main offices, then, of phosphoric acid and potash are the opposite to that of nitrogen and are directed toward increasing the number of ears of corn, bolls of cotton, grains of wheat, etc., and to make them mature earlier. Large amounts of acid phosphate in mixed fertilizers or by itself will not only make cotton boll more heavily, but will hasten very materially the opening of the cotton. This should be especially borne in mind in the fertilization of land which grows this crop late, where it is liable to be caught and damaged by early frost.

Potash has a tendency to rather prolong the growth of crops, but, like phosphoric acid, it aids very materially in the fruiting of them.

These facts relating to the parts played by the three fertilizer constituents in the growth of plants should be kept clearly in mind in selecting fertilizers for different soils, as only by observing what the land will do itself can the fertilizer constituents be combined in such a way as to produce the best proportion of stalk and fruit. The first essential in the production of a good crop of any kind is a good-sized stalk to bear the crop. Nitrogen is the prime constituent in doing this, after which phosphoric and potash need to be combined with it in such proportions as will give the larggest yield in cotton, corn, or whatever else is being grown.

In some of the preceding articles (fertilizers for tobacco and cotton) the materials furnishing nitrogen, phosphoric acid and potash have been combined on basis of the observation of farmers and experimental results in such a way as to give a good development of the different parts of these plants. In future papers it is proposed to discuss and present in a similar way formulas that will furnish the three fertilizer constituents in good proportions for our other main farm and garden crops.

B. W. KILGORE.

TALKS ON INSECT PESTS.

II.—A Little General Information on the Subject.

Editors Progressive Farmer:

Before we go further with these "talks," it will be well to impress some matters firmly upon the minds of Progressive Farmer readers.

First. The work of the eutomologist in this State pertains strictly to insects and insect pests. He has nothing to do with preventing the rusts, rots, blights, scabs, etc., on trees, fruits or plants; such inquiries should be addressed to Dr. F. L. Stevens, West Raleigh, N. C. Nor has he anything to do with the selection of varieties of fruits or vegetables, or the fertilization or culture of them; such inquiries should be addressed to Prof. W. F. Massey, Raleigh, N. C. But all matters pertaining to real insect pests, such as cutworms, grubs, caterpillars, flies, butterflies, maggots, grasshoppers, scale insects, etc., should be addressed to the eutomologist, and he will be glad to give his careful attention to any such inquiries.

Second. It is not to be expected that we shall exterminate insect pests even by the most painstaking work. You will never find "extermination" advocated in my circulars or in these talks, for it is only possible in a very few exceptional cases. Insects are so small, so numerous, and in many cases so very active and shy, that no system of treatment is apt to get rid of them all. We must expect to repeat any remedy, even the most effective, from time to time, when the pests become destructive. What we can expect to do is, to keep the pests within reasonable control so that the crop which is attacked may still be produced at a profit. This is a very different thing from "extermination," and is at the same time a great improvement over letting the crop go to ruin.

There is still another matter which every reader of The Progressive Farmer should know about, and that is this: The entomologist is issuing a series of "Entomological Circulars," each of which is intended to fully discuss some important subject in connection with insects or insect pests. All of these circulars are for free distribution to all who ask for them, but remember that if you wish to get them regularly as they are issued, you must first write to me for an "application blank for entomological circulars," which I will mail you. You must then fill out the blank and return to me again. We require this to be done as we do not wish to send these circulars to persons who will not appreciate them.

Now, when you wish to inquire about any kind of insect pest, remember that specimens should always be sent if it is possible to secure them. It is utterly useless to write a description of some unfamiliar insect. Such a description is generally worse than none at all, for it only confuses me. Remember that there are very many thousands of different kinds of insects, and the one which you have in mind may not be guilty of harm. We have had specimens of certain very beneficial insects sent to us by persons who supposed that they were doing harm. Secure some of the specimens about which you desire information and place them with some of their food in a tight wooden, tin or paste-board box, wrap neatly, place your name on the outside of the package and mail directly to me. Do not make any holes for air, for it isn't necessary. Write a letter giving all facts known to you regarding the insects, and send in an envelope by itself. Never send insects loose in a letter. If your suspect that your trees are infested with scale insects, cut several sections of the infested twigs, three or four inches long, wrap in a neat package and mail to me.

One thing more. In order to combat insects properly, it is necessary to be very prompt in our work against them. A month ago we had an article in these columns on the spraying of apples and pears, in which it was stated that it was then time to prepare for the work and advised all who were interested to write to us at once for Entomological Circulars Nos. 4 and 6, but many delayed until now it is almost too late to get apparatus in time for the first sprayings of fruit trees. But all right, if you are interested, write now for any of the circulars mentioned below which you may be interested in. Here is the list of all that have been issued to date:

Entomological Circular No. 1, Hessian Fly; No. 2, Cotton Boll Worm; No. 3, Round-head Apple-tree Borer; No. 4, Spraying Apparatus; No. 5, Lime Salt Sulphur Wash for San Jose Scale; No. 6, Spraying Apples and Pears; No. 7, The Peach-tree Borer.

Another circular which you should have, although it does not belong to this series, is Circular No. 5, of the Crop Pest Commission, which gives "Suggestions to Purchasers of Nursery Stock in North Carolina."

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